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REMARKS

In the Office Action, the Examiner noted that claims 1-11 are pending in the application and that claims 1-11 stand rejected. By this response, claims 1, 7, 10, and 11 are amended to more clearly define the Applicant's invention and not in response to prior art. All other claims continue unamended.

In view of the amendments presented above and the following discussion, the Applicant respectfully submits that none of the claims now pending in the application are obvious under the provisions of 35 U.S.C. § 103. Furthermore, the Applicant also submits that all of these claims now satisfy the requirements of 35 U.S.C. § 112. Thus, the Applicant believes that all of these claims are now in allowable form.

Rejections

A. 35 U.S.C. § 112

The Examiner rejected claims 1-11 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

Claims 1 and 7

The Examiner rejected claims 1 and 7 as being incomplete for omitting essential structure cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections.

In response the Applicant has amended claims 1 and 7 to more particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. As such, the Applicant submits that the basis for the Examiner's rejection of claims 1 and 7 has been removed, and respectfully requests that the Examiner's rejection of claims 1 and 7 be withdrawn.

Having made these changes, the Applicant submits that claims 1 and 7, as they now stand, are definite and hence fully satisfy the requirements of 35 U.S.C. § 112, second paragraph, and are patentable thereunder.

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Claims 1, 7 and 10

The Examiner rejected claims 1, 7 and 10 as being indefinite for failing to particularly point out what the number of segments are equal to.

In claims 1, 7 and 10 the Applicant claims that the number of segments connecting the primary input to each of the terminal nodes is equal. More specifically, the Applicant is including the limitation in claims 1, 7 and 10 that the number of segments electrically connecting the primary input to a terminal is equal to the number of segments connecting the primary input to any other terminal. As such, and because all of the segments within a relative level are equal, the path lengths between the primary input terminal and each of the terminal nodes are all equal. As such, the Applicant respectfully submits that claims 1, 7 and 10 are definite and do particularly point out that the number of segments between the primary input and any of the terminal nodes are equal in numbers.

As such, the Applicant submits that claims 1, 7 and 10, as they now stand, are definite and hence fully satisfy the requirements of 35 U.S.C. § 112, second paragraph, and are patentable thereunder.

Claims 2-6, 8, 9 and 11

The Examiner rejected claims 2-6, 8, 9 and 11 under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention as cited in the independent claims in which they depend.

Dependent claims 2-6, 8, 9 and 11 depend either directly or indirectly from independent claims 1, 7 and 10 and recite additional features therefor. Having made the changes above with regard to claims 1, 7 and 10, the Applicant submits that dependent claims 2-6, 8, 9 and 11 as they now stand, are definite and hence fully satisfy the requirements of 35 U.S.C. § 112, second paragraph, and are patentable thereunder.

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B. 35 U.S.C. § 103(a)

The Examiner rejected claims 1-5 and 10-11 under 35 U.S.C. § 103(a) as being unpatentable over Watanabe et al., (U.S. Patent 5,309,001, hereinafter "Watanabe"). The rejection is respectfully traversed.

The Examiner alleges that Watanabe discloses a network Fig. 12a for distributing a power signal in an optoelectronic circuit 350 comprising a plurality of electrically conductive pathways forming at least one level, wherein the portions of the conductive pathways are interconnected; a plurality of segments 353a-353b forming each level, wherein each segment of the level is equal in length; means for coupling 347/352 the power signal from a primary input to a point at the center of a first level; terminal nodes 359a-b coupled at the extremities of a last level for supplying the power signal to devices that form at least a portion of the optoelectronic circuit 350; and wherein the number of segments connecting the primary input to each of the terminal nodes is equal.

The Examiner correctly concedes that Watanabe fails to teach that the network is used for supplying power signal to a plurality of devices. As such, the Examiner alleges that it would have been obvious to one of ordinary skill in the art at the time the invention was made to divide the device into multiple sections, since it is inherent that each portion of the single device of Watanabe would operate as an individual unit having its own power signal. The Examiner further alleges that it has been held that constructing a formerly integral structure in various elements involves only a routine skill in the art. The Applicant respectfully disagrees.

Watanabe teaches a surface electrode on the surface of an LED, wherein the surface electrode and the semiconductor layer are in electrical contact with each other at ends of the highest-order branches. (See Watanabe, ABSTRACT). In support of its invention Watanabe teaches:

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"At the ends of the sixth-order branches 358a and 358b, **there are provided contact portions 359a and 359b for making ohmic contact with the underlying semiconductor layer 351.** Meanwhile, the rest of the surface electrode 347 other than the contact portions 359a and 359b is in a state in which a Schottky barrier are yielded on the surface of the semiconductor layer 351." (See Watanabe, col. 16, lines 1-7). (emphasis added).

"Further, since the end portions of the sixth-order (highest-order) branches 358a and 358b and the semiconductor layer 351 are put into successful ohmic contact with each other through the contact portions 359a and 359b while the rest other than the end portions and the semiconductor layer 351 are brought into a state in which the current is suppressed from flowing by the Schottky barrier (i.e. a state in which current will not flow unless a certain high level of voltage is applied), the current can be injected only at the end portions of the surface electrode 351. Accordingly, the light easily goes out of the LED, which leads to further improved external quantum efficiency." (See Watanabe, col. 16, lines 38-50).

The structure of the invention of Watanabe, as taught, includes contact portions in the highest-order branches for making ohmic contact with the underlying semiconductor layer. Watanabe fails though, to teach or suggest at least the invention of the Applicant's claim 1 as follows:

"A network for distributing a power signal in an optoelectronic circuit, said network comprising:

a plurality of electrically conductive pathways forming at least a first level, wherein each level is comprised of a plurality of segments linearly extending from a common point, each of the segments of respective levels having equal lengths, and wherein the segments of a next order higher level are formed at the extremities of a previous order lower level;

means for coupling said power signal from a primary input to a point at the center of the first level; and

terminal nodes coupled at the extremities of a last level for supplying said power signal to a plurality of devices that form at least a portion of said optoelectronic circuit, wherein the number of segments connecting said primary input to each of said terminal nodes is equal such that the power supplied by the terminal nodes to each of the plurality of devices is substantially equal." (emphasis added).

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In contrast, the Applicant's invention is directed at least in part to a power distribution network having very different structural limitations. In support of the present invention, the Applicant discloses:

"Terminal nodes are coupled to the endpoints of the last level of the H-tree. In this manner a conductive pathway is formed from the primary input to each terminal node, with portions of each conductive pathway being shared between two or more terminal nodes." (See Specification, page 7, lines 13-16).

"The first level is coupled to the primary input, at the center of the two horizontal segments of the H pattern. The conductive pathways distribute a power signal to terminal nodes 16 (represented by circles and as further indicated in the upper right hand quadrant for a portion of the terminal nodes of FIG. 3) on VLSI chip 20, wherein the distance from the primary input to each terminal node 16 is equal. In this illustrative example, **each terminal node 16 represents a VCSEL and its associated driver.**" (See Specification, page 6, lines 22-29). (emphasis added).

"In operation of the present invention, the effect of voltage drops due to power supply line resistance are reduced when DC power is distributed to the terminal nodes of an optoelectronic circuit, namely the VCSELs in an array of VCSELs of an OE-VLSI chip, with the H-tree power distribution network. Since the lengths of the conductive pathways to each terminal node are equal, there is greater uniformity of the voltage and current provided to each terminal node." (See Specification, page 8, lines 3-8).

It is evident from the Applicant's disclosure, that the Applicant's invention is directed at least in part to a power distribution network for providing uniform power to external devices connected to each terminal node. As such, it is clear that the terminal nodes of the Applicant's invention are not in ohmic contact with an underlying layer. Furthermore, in support of at least claim 1, the Applicant in the Specification specifically recites:

"Each 'H' pattern includes six equal length segments, with two segments in each of two parallel portions and two segments connected perpendicular at the midpoints of the parallel portions to form the H pattern." (See Specification, page 7, lines 3-5).

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The Applicant further recites:

"Since the length of each segment is equal for a respective level and the total number of segments to each terminal node is also equal, the length of the conductive pathway from the primary input to each terminal node is the same." (See Specification, page 7, lines 16-19).

It is apparent from the sections of the disclosure presented above that the Applicant's invention is directed at least in part to a power distribution network wherein each of the segments comprising each layer are of equal lengths and the total number of segments connecting each terminal node the primary input are equal. As such, the power provided to each of the plurality of terminal nodes at a last level and subsequently to each of a plurality of connected devices is substantially equal.

The invention of Watanabe is incapable of providing uniform power to devices connected to each terminal node because the surface electrode and the semiconductor layer are in electrical contact with each other at ends of the highest-order branches. The Applicant respectfully submits that at least the structural differences between the highest-order branches of the Applicant's invention and the highest-order branches of the invention of Watanabe make the Applicant's invention patentable over the invention of Watanabe. The Applicant further submits that the structural configuration of the Applicant's highest-order branches are not obvious in view of the invention of Watanabe. The Applicant's invention and the invention of Watanabe are directed to two different devices having different structural limitations used for solving different problems. There is absolutely no teaching or suggestion in Watanabe for the Applicant's invention at least with respect to claim 1 and specifically for the structural limitations of the terminal nodes of the Applicant's invention as described above. More specifically, there is absolutely no teaching, suggestion or disclosure in Watanabe for "a plurality of electrically conductive pathways forming at least a first level, wherein each level is comprised of a plurality of segments linearly

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extending from a common point, each of the segments of respective levels having equal lengths" (emphasis added), as taught by the Applicant's specification and claimed in at least the Applicant's claim 1.

Even further, there is absolutely no teaching, suggestion or disclosure in Watanabe for "terminal nodes coupled at the extremities of a last level for supplying said power signal to a plurality of devices that form at least a portion of said optoelectronic circuit, wherein the number of segments connecting said primary input to each of said terminal nodes is equal such that the power supplied by the terminal nodes to each of the plurality of devices is substantially equal" (emphasis added) as taught by the Applicant's specification and claimed in at least the Applicant's claim 1. Therefore, the Applicant respectfully submits that the Applicant's invention and the invention of Watanabe are directed to two different devices having different structural limitations used for solving different problems. There is absolutely no teaching or suggestion in Watanabe for the Applicant's invention at least with respect to claim 1 and specifically for the structural limitations of the Applicant's invention as described above.

As such, the Applicant respectfully submits that Watanabe does not teach or suggest the Applicant's claim 1. Specifically, the Applicant submits that the structural limitations of at least the Applicant's claim 1 are not taught or suggested by Watanabe. Therefore, the Applicant submits that independent claim 1, as it now stands, fully satisfies the requirements of 35 U.S.C. § 103 and is patentable thereunder.

Likewise, independent claim 10 recites similar relevant features as recited in claim 1. As such, and for at least the reasons stated herein, the Applicant submits that Watanabe does not teach or suggest independent claim 10, and that independent claim 10 as it now stands, also fully satisfies the requirements of 35 U.S.C. § 103 and is patentable thereunder. Even further, the Applicant respectfully submits, that even if the structural limitations of the Applicant's invention and the invention of Watanabe were the same (which the Applicant

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submits that they are not), the inventive method of claim 10 would not unpatentable because of the similarity of the structures.

Furthermore, dependent claims 2-5 and 11 depend directly from independent claims 1 and 10 and recite additional limitations therefore. As such and for at least the reasons set forth above, the Applicant submits that none of these claims are obvious with respect to the teachings of Watanabe. Therefore, the Applicant submits that all these dependent claims also fully satisfy the requirements of 35 U.S.C. § 103 and are patentable thereunder.

The Applicant reserves the right to establish the patentability of each of the claims individually in subsequent prosecution.

C. 35 U.S.C. § 103(a)

The Examiner rejected claims 6-9 under 35 U.S.C. § 103(a) as being unpatentable over Watanabe as applied to claims 1-5 and 10-11 above, and further in view of Olbright et al., (U.S. Patent 5,266,794, hereinafter "Olbright")/ Schneider et al., (U.S. Patent 5,351,256, hereinafter "Schneider") and Lebby et al., (U.S. Patent 5,337,397, hereinafter "Lebby"). The rejection is respectfully traversed.

Claim 6

Claim 6 depends directly from independent claim 1 and recites limitations thereof. The Examiner applied Watanabe to claim 6 as described above for the Examiner's rejection of claim 1. The Examiner alleges that Watanabe teaches all of the stated limitations except for the integrated circuits are VCSELs; instead Watanabe teach the integrated circuits are LEDs. The Applicant respectfully disagrees.

The Examiner correctly concedes that Watanabe does not teach that the integrated circuits are VCSELs as claimed in claim 6 of the Applicant's invention.

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In addition and as described above, the teachings of Watanabe do not suggest or describe at least the Applicants' invention at least with regard to claim 1 for "a plurality of electrically conductive pathways forming at least a first level, wherein each level is comprised of a plurality of segments linearly extending from a common point, each of the segments of respective levels having equal lengths" (emphasis added), or for "terminal nodes coupled at the extremities of a last level for supplying said power signal to a plurality of devices that form at least a portion of said optoelectronic circuit, wherein the number of segments connecting said primary input to each of said terminal nodes is equal such that the power supplied by the terminal nodes to each of the plurality of devices is substantially equal" (emphasis added).

Furthermore, the teachings of Olbright, Schneider, or Lebby, alone, do not teach, suggest, or describe the invention of the Applicant, at least with regard to claim 1. Neither Olbright, Schneider, nor Lebby, teach or suggest "a plurality of electrically conductive pathways forming at least a first level, wherein each level is comprised of a plurality of segments linearly extending from a common point, each of the segments of respective levels having equal lengths" or "terminal nodes coupled at the extremities of a last level for supplying said power signal to a plurality of devices that form at least a portion of said optoelectronic circuit, wherein the number of segments connecting said primary input to each of said terminal nodes is equal such that the power supplied by the terminal nodes to each of the plurality of devices is substantially equal."

The Applicant further submits that there is no suggestion or motivation to combine the teachings of Watanabe and the teachings of Olbright, Schneider, or Lebby.

For prior art reference to be combined to render obvious a subsequent invention under 35 U.S.C. § 103, there must be something in the prior art as a whole which suggests the desirability, and thus the obviousness, of making the combination. Uniroyal v. Rudkin-Wiley, 5 U.S.P.SQ.2d 1434, 1438 (Fed. Cir. 1988). The teachings of the references can be combined only if there is some

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suggestion or incentive in the prior art to do so. In re Fine, 5 U.S.P.S.Q.2d 1596, 1599 (Fed. Cir. 1988). Hindsight is strictly forbidden. It is impermissible to use the claims as a framework to pick and choose among individual references to recreate the claimed invention Id. at 1600; W.L. Gore Associates, Inc., v. Garlock, Inc., 220 U.S.P.Q. 303, 312 (Fed. Cir. 1983).

Moreover, the mere fact that a prior art structure could be modified to produce the claimed invention would not have made the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992); In re Gordon, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984);

The Applicant further submits that even if there was a motivation or suggestion to combine the references (which the Applicant believes that there is none), the teachings of Olbright, Schneider, and Lebby, either alone or in any allowable combination, fail to bridge the substantial gap between the Applicant's invention, and the teachings of Watanabe.

The Examiner further alleges that it is well known in the laser art that one may use either laser source (e.g. LED or VCSEL) as a matter of obvious design choice, see Olbright col. 8, lines 65-68/Schneider col. 1, lines 14-16/Lebby col. 3, lines 17-27. The Applicant respectfully disagrees.

The suggestion by the Examiner that the function of an LED is interchangeable with the function of a VCSEL in no way renders obvious a network for distributing a power signal wherein "a plurality of electrically conductive pathways forming at least a first level, wherein each level is comprised of a plurality of segments linearly extending from a common point, each of the segments of respective levels having equal lengths" and wherein "terminal nodes coupled at the extremities of a last level for supplying said power signal to a plurality of devices that form at least a portion of said optoelectronic circuit, wherein the number of segments connecting said primary input to each of said terminal nodes is equal such that the power supplied by the terminal nodes to each of the plurality of devices is substantially equal" as claimed in at least the

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Applicant's claim 1. It is true that an LED may be interchangeable with a VCSEL in some applications when using said devices as light sources, but the powering requirements or powering methods for an LED and a VCSEL are not similar at all. As stated above, the Applicant's invention is, at least in part, directed to powering a plurality of devices, such as VCSELs, that benefit in operation when receiving a uniform bias voltage among the plurality of devices. As such, to allege that one may use either a laser source (e.g. LED or VCSEL) as a matter of obvious design choice in this capacity (i.e. powering requirements) would be an incorrect statement or analogy.

As such, and at least for the reason that neither Olbright, Schneider, nor Lebby, alone or in any combination with Watanabe, do not teach, suggest, or describe the Applicants' invention with regard to claim 1, the Applicants respectfully submit that dependent claim 6 is also not rendered obvious by Watanabe in view of Olbright, Schneider, or Lebby.

Therefore, the Applicant submits that claim 6 as it now stands, fully satisfies the requirements of 35 U.S.C. § 103 and is patentable thereunder.

Claims 7-9

The Examiner alleges that regarding claims 7-9, Watanabe teaches all the stated limitations except for the plurality of electrically conductive pathways being separate; instead, Watanabe teaches the pathways being formed of wider/broader pathways that diverge as it branches to a higher level/order. The Applicant respectfully disagrees.

Claim 7 is an independent claim that recites similar relevant features as those recited in claim 1. As described above with regard to the Examiner's rejection of claim 1, the teachings of Watanabe do not teach, suggest or describe at least the Applicants' invention with regard to claim 1 for "a plurality of electrically conductive pathways forming at least a first level, wherein each level is comprised of a plurality of segments linearly extending from a common point, each of the segments of respective level having equal lengths" or for "terminal

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nodes coupled at the extremities of a last level for supplying said power signal to a plurality of devices that form at least a portion of said optoelectronic circuit, wherein the number of segments connecting said primary input to each of said terminal nodes is equal such that the power supplied by the terminal nodes to each of the plurality of devices is substantially equal". As independent claim 7 recites similar relevant features as those recited in claim 1, the Applicant respectfully submits that the teachings of Watanabe also do not teach, suggest or describe at least the Applicants' invention with regard to claim 7.

Furthermore, the teachings of Olbright, Schneider, or Lebby, alone, do not teach, suggest, or describe the invention of the Applicant, at least with regard to claim 1. Neither Olbright, Schneider, nor Lebby, teach or suggest "a plurality of electrically conductive pathways forming at least a first level, wherein each level is comprised of a plurality of segments linearly extending from a common point, each of the segments of respective levels having equal lengths" or "terminal nodes coupled at the extremities of a last level for supplying said power signal to a plurality of devices that form at least a portion of said optoelectronic circuit, wherein the number of segments connecting said primary input to each of said terminal nodes is equal such that the power supplied by the terminal nodes to each of the plurality of devices is substantially equal."

The Applicant further submits that there is no suggestion or motivation to combine the teachings of Watanabe and the teachings of Olbright, Schneider, or Lebby. Even if there was a motivation or suggestion to combine (which the Applicant believes that there is none), the teachings of Olbright, Schneider, and Lebby, either alone or in any allowable combination, fail to bridge the substantial gap between the Applicant's invention, and the teachings of Watanabe.

Therefore, the Applicant submits that claim 7 as it now stands, fully satisfies the requirements of 35 U.S.C. § 103 and is patentable thereunder.

Furthermore, dependent claims 8 and 9 depend directly from claim 7 and recite additional features therefor. As such and for at least the reasons set forth herein, the Applicant submits that none of these claims are obvious with respect

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to the teachings of Watanabe, Olbright, Schneider, and Lebby, alone or in any allowable combination. Therefore the Applicant submits that all these dependent claims also fully satisfy the requirements of 35 U.S.C. § 103 and are patentable thereunder.

Conclusion

Thus the Applicant submits that none of the claims, presently in the application, are obvious under the provisions of 35 U.S.C. § 103. Furthermore, the Applicant also submits that all of these claims now fully satisfy the requirements of 35 U.S.C. § 112. Consequently, the Applicant believes that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Jorge Tony Villabon, Esq. at (732) 530-9404 x 1131 or Eamon J. Wall, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,



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